

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION  
JACKING, DRY BORING, BORING WITH DRILLING FLUID,  
TUNNELING AND DIRECTIONAL BORING**

**NOTICE:**

Before jacking, dry boring, boring with drilling fluid, tunneling or directional boring is begun, written approval must be obtained from the District Engineer on the method to be used. The District Engineer reserves the right to require a change in the method when, due to soil conditions or other reasons, the desired results are not being obtained.

Before any jacking, dry boring, boring with drilling fluid, tunneling or directional boring is begun, the District Engineer will be advised, in writing, whether the work will be performed by the applicant's forces or by contract and, if by contract, the name of the contractor.

Jetting will not be permitted.

Any overcutting exceeding the tolerances set forth in this document shall be filled immediately with flowable fill or other approved materials.

The applicant shall be responsible for correction of any distortion caused by his/her operation on any road, street, frontage road, ramp, conventional highway, partially controlled highway, fully controlled access highway and/or roadway cross-section. The method of correction shall be approved by the District Engineer.

Failure to comply with the requirements for jacking, dry boring, boring with drilling fluid, tunneling, and/or directional boring operations or failure to comply with the approved permit requirements shall be cause for canceling the permit.

The applicant, by signing this document, certifies that the design and type of materials and method of operations are of the industry standard where the industry standard is indicated below.

**JACKING**

JACKING will be accomplished as follows:

Pushing or jacking of casing or carrier pipes under the highway larger than three and one half (3-1/2) inches in diameter is prohibited. All casing or carrier pipe will be of strength sufficient to withstand the stress resulting from jacking pressures.

**DRY BORING**

DRY BORING will be accomplished as follows:

For pipes greater than eight (8) inches in diameter, the maximum diameter of the borehole shall be the outside diameter of the casing or carrier pipe plus two (2) inches (Pipe O.D. + 2"). For pipes less than or equal to eight (8) inches in diameter, the maximum diameter of the borehole shall be the outside diameter of the casing or carrier pipe plus one (1) inch (Pipe O.D. + 1").

Water bearing sands and muck soils will be well pointed as necessary prior to commencing the bore.

All bores will be accomplished with the auger inside the casing or carrier pipe with the cutting edges positioned just ahead of the pipe except as follows:

- (1) Dry boring with the auger not inside the casing or carrier pipe may be permitted in bores eight (8) inches or less in diameter in dense consolidated soils.
- (2) Dry boring with the auger not inside the casing or carrier pipe may be permitted in bores three (3) inches or less in diameter in loose sandy soils or other soils which easily cave or spall.

Care should be exercised at all times to keep the auger properly positioned within the casing or carrier pipe and to maintain sufficient forward pressure upon the casing or carrier pipe to quickly run through any pockets of loose soil.

All boring with or without the auger inside the casing or carrier pipe will be carefully observed for comparison between the amount of cuttings removed from the hole and the diameter of the bore, together with the distance the auger has traveled in the bore. An excessive amount of cuttings removed from the bore indicates caving or spalling of the bore wall, in this case, the bore shall be stopped until a method for completing the bore acceptable to the Mississippi Department of Transportation has been agreed upon.

An acceptable fluid may be introduced by gravity flow approximately three (3) feet back of the forward end of the casing or carrier pipe to lubricate the cuttings in order to facilitate the removal thereof; however, the excessive use of such fluid causing undue flow back and erosion of the bore is prohibited.

#### BORING WITH DRILLING FLUID

Boring with Drilling Fluid will be accomplished as follows:

The maximum diameter of the borehole shall be the outside diameter of the casing or carrier pipe plus two inches (Pipe O.D. + 2") with an open type bit that leaves the cuttings in place.

The design and type of drilling fluid and the method used for the boring with drilling fluid work shall be of the industry standard.

Drilling fluid is used to lubricate the cutters or reamers, consolidate the cuttings into plugs of appropriate length, seal the wall of the bore to form a filter cake in order to prevent cave-ins or spalling, maintain the arch, and lubricate the bore for easy removal of masses or plugs of cuttings from the bore by using compressed air and for the installation of the casing or carrier pipe immediately thereafter. The excessive use of drilling fluid that causes undue flow back and erosion of the bore may be a violation of the approved method and, pending a Department evaluation, be cause for canceling the permit.

When boring in sandy subsoils, fine sands, water-bearing sands, or any solid which easily spalls or caves, the bores entrance will be plugged or dammed in order to retain both the drilling fluid and the cuttings within the bore until the time immediately before the casing or carrier pipe is installed. Water bearing sands and mucky soils will be pointed as necessary prior to commencing the bore. When drilling through dense consolidated soils, the cuttings may be partially removed from the hole in approximately three (3) foot plugs by the use of compressed air or by retraction of the cutter or reamer. No cutter or reamer larger than three (3) inches in diameter shall have holes therein larger than five sixteenth (5/16) inches in diameter through which drilling fluid is forced during boring.

#### TUNNELING

Tunneling will be accomplished by the following methods:

First, using jacking equipment where the pipe is aimed and jacked ahead as the earth is excavated by hand or with the aid of mechanical tools just ahead of the pipe end, OR

Second, when enough opening for the tunnel is excavated ahead, the tunnel liner plates are bolted together to extend the liner until it is complete.

In both methods, the pipe or tunnel must be of sufficient size to permit entry, excavating ahead, and disposal of the material through the pipe or tunnel. Excavation around the pipe or liner should be the minimum necessary for jacking or working clearances.

The pipe specifications used in the tunneling method of the crossing installation shall comply with the same specifications for pipe used for jacking and boring.

The tunnel liner plate or section specifications shall be fabricated of galvanized steel of the proper gauge and section modulus to withstand the live load and fill height. In acid soil areas, the liner will be required to be asphalt coated. If used as a cross drain, a paved invert may be required.

All pipe or liner tunneled will be fitted with grout vents and grout pumped into the voids around the pipe or liner at not less than 45 psi. The design and spacing of the vents, the grout mixture and method used for filling the void between the finished tunnel and outline of the excavation shall be of the industry standard.

#### DIRECTIONAL BORING

Directional boring will be accomplished by the following method:

A pilot hole is drilled beginning at a prescribed angle from horizontal and continues across the obstruction along a design profile made of straight tangents and long radius arcs.

Once the pilot hole is made, the casing or carrier line can be pulled through. The casing or carrier line is prefabricated on the bank opposite the drilling rig. A reamer is attached to the drill string and then connected to the casing or carrier line pull head via a swivel. The swivel prevents any translation of the reamer's rotation into the casing or carrier line string allowing for a smooth pull in to the drilled hole. The drilling rig then begins the pullback operation, rotating and pulling on the drill string and once again circulating high volumes of drill slurry. The pull back continues until the reamer and casing or carrier line returns to the drilling rig.

The design and type of drilling slurry and method used for the drilling operation shall be of the industry standard.

Signed: \_\_\_\_\_  
Name of Party Signing Application

\_\_\_\_\_  
Title Date

Field Inspection By: \_\_\_\_\_ 20\_\_\_\_

Approved: MISSISSIPPI DEPARTMENT OF TRANSPORTATION

\_\_\_\_\_  
Deputy Executive Director/Chief Engineer

By: \_\_\_\_\_ 20\_\_\_\_

Installation Inspection By: \_\_\_\_\_ 20\_\_\_\_